

Claims

1. In a projection system that includes an image projection system adapted to project an image, a text projection system which is adapted to project text in a text box onto the image projected by the image projection system, the text projection system comprising:

a light source adapted to project light to display text in a text box;
a light path modifier positioned to receive light from the light source;
a relay lens positioned to receive light from the light path modifier;
a display device positioned to receive the light from the relay lens; and
a projection lens positioned to receive the light from the display device and to direct the light so as to superimpose the text box onto the image projected by the image projection system,

wherein the relay lens defines the position of an object plane and wherein the light path modifier is sufficiently offset from the object plane to decrease the sharpness of borders of the text box so that contrast between the text box and the image projected by the image projection system is diminished.

2. The image projection system of claim 1, in which the light path modifier is offset from the object plane toward the light source.

3. The image projection system of claim 1, in which the light path modifier is offset from the object plane away from the light source.

4. The image projection system of claim 1, in which the light path modifier is sufficiently offset from the object plane to enable the image projected by the image projection system to be at least partially visible through the text box.

5. The image projection system of claim 1, in which the position of the light path modifier causes the light to be concentrated towards the center of the text box and increasingly diffuse approaching the edges of the text box enabling the borders of the text box to be unfocused and yet the text in the text box is completely legible.

6. The image projection system of claim 1, in which the relay lens condenses light from the light path modifier.

7. The image projection system of claim 1, in which the projection system includes a pair of condensing lenses, the pair being positioned to receive the light from the light path modifier and to direct the light to the relay lens.

8. The image projection on system of claim 1, in which the light path modifier is an integrator tunnel.

9. The image projection system of claim 1, in which the light path modifier is a pair of fly eye panels.

10. The image projection system of claim 1, in which the display device is transmissive.

11. The image projection system of claim 1, in which the display device is reflective.

12. A projection system, comprising:
an image projection system adapted to project an image; and
a text projection system adapted to project text in a text box,
wherein the text projection system comprises a light path modifier
positioned to receive light from a light source and to direct the light to a relay lens, the
relay lens being positioned to transmit the light toward a display device positioned to direct
the light to a projection lens,

wherein the projection lens is positioned to superimpose the text box onto
the image projected by the image projection system, and

wherein the relay lens defines the position of an object plane and wherein
light path modifier is sufficiently offset from the object plane to decrease the sharpness of
borders of the text box so that contrast between the text box and the image projected by the
image projection system is diminished.

13. The image projection system of claim 12, in which the light path
modifier is offset from the object plane toward the light source.

14. The image projection system of claim 12, in which the light path
modifier is offset from the object plane away from the light source.

15. The image projection system of claim 12, in which the light path
modifier is sufficiently offset from the object plane to enable the image projected by the
image projection system to be at least partially visible through the text box.

16. The image projection system of claim 12, in which the position of the
light path modifier causes the light to be diffused at the borders of the text box.

17. The image projection system of claim 12, in which the relay lens also
operates as a condensing lens.

18. The image projection system of claim 12, in which the projection system includes a pair of condensing lens, the pair being positioned to receive light from the light path modifier and to direct the light to the relay lens.

19. The image projection system of claim 12, in which the light path modifier is an integrator tunnel.

20. The image projection system of claim 12, in which the light path modifier is a pair of fly eye panels.

21. The image projection system of claim 12, in which the display device is transmissive.

22. The image projection system of claim 12, in which the display device is reflective.

23. A method for projecting an image with subtitles that minimizes the contrast at a transition from a text box around the subtitles to a projected image, comprising:

- obtaining an image projection system adapted to project an image;
- obtaining a text projection system having optical elements adapted to project light to display the text in the text box; and
- adjusting the optical elements of the text projection system so that the light projected by the text projection system is diffused along borders of the text box.

24. The method of claim 23, in which the text projection system includes:
a light source adapted to project light to display text in a text box;
a light path modifier being positioned to receive light at its entry end from the light source;
a relay lens being positioned to receive the light from the light path modifier;
a display device positioned to receive the light transmitted from the relay lens; and
a projection lens positioned to receive the light from the display device and to direct the light so as to superimpose the text box onto the image projected by the image projection system.

25. The method of claim 24 further comprising:
identifying the position of an object plane as defined by the relay lens; and
positioning the light path modifier relative to the object plane such that the light path modifier is sufficiently offset from the object plane to decrease the sharpness of borders of the text box so that contrast between the text box and the image projected by the image projection system is diminished.

26. The method of claim 25, in which the light path modifier is sufficiently offset from the object plane to enable the image projected by the image projection system to be visible through the text box.